

Amendment to the Claims

A complete list of all the presently or formerly pending claims in the application is provided below, with suitable headings to show the status of each claim.

1. (Currently Amended) An X-ray tube subsystem comprising:

an X-ray tube including a grid connected to a grid bias connection, a cathode connected to a filament bias connection, an anode connected to an anode bias connection; and

~~a variable-grid voltage supply connected between the grid bias connection and the filament bias connection, said grid voltage supply producing a positive ion collection voltage on the order of 10 to 30 volts to produce a negative output voltage level at the grid bias connection with respect to the filament bias connection, the output voltage level of the variable voltage supply adapted to produce a first voltage level to focus an electron beam, a second voltage level to collect ions, and a third voltage level to stop the electron beam.~~

2. (Cancelled)

3. (Currently Amended) The X-ray tube subsystem of claim 1, wherein ~~a magnitude of the second voltage level is greater than 100 volts, and a magnitude of the first voltage level is in a range of 10 to 30 volts~~ said grid is adapted to receive a focus voltage, a stop voltage and said ion collection voltage.

4. (Previously presented) The X-ray tube subsystem of claim 1, further comprising a Faraday cage surrounding the variable voltage supply.

5. (Cancelled)

6. (Original) The X-ray tube subsystem of claim 1, further comprising a filament voltage supply connected to the filament bias connection.

7. (Previously presented) The X-ray tube subsystem of claim 6, wherein a Faraday cage is connected to the filament voltage supply.

8. (Previously presented) The X-ray tube subsystem of claim 6, further comprising an anode voltage supply connected to the anode bias connection and a ground reference, and a cathode voltage supply connected to an earth ground and the filament bias connection.

9. (Currently Amended) A method for operating an X-ray system to reduce high voltage breakdown events, the method comprising:

providing an X-ray tube that includes a grid connected to a grid bias connection and a cathode connected to a filament bias connection; and

~~during X-ray tube operation, varying a voltage level between the grid bias connection and the filament bias connection to produce a first voltage level to focus an electron beam, a second voltage level to collect ions, and a third voltage level to stop the electron beam~~
creating an ion collection voltage between the grid bias connection and the filament connection on the order of 10 to 30 volts.

10. (Cancelled)

11. (Cancelled)

12. (Currently amended) The method of claim 9, further comprising providing a Faraday cage surrounding a ~~variable voltage supply that generate the first voltage level, the second voltage level, and the third voltage level~~ grid voltage supply that creates the ion collection voltage.

13. (Original) The method of claim 12, further comprising providing a connection between the Faraday cage and the filament bias connection.

14. (Currently Amended) An X-ray examination system comprising:

an X-ray tube including a grid connected to a grid bias connection and a cathode connected to a filament bias connection;

a ~~variable~~ voltage supply connected between the grid bias connection and the filament bias connection, said grid voltage supply producing a positive ion collection voltage on the order of 10 to 30 volts to sweep free ions out of the x-ray tube ~~to produce a negative output voltage level at the grid bias connection with respect to the filament bias connection, the output voltage level of the variable voltage supply adapted to produce a first voltage level to focus an electron beam, a second voltage level to sweep free ions out of the X ray tube, and a third voltage level to stop the electron beam;~~

an X-ray detector to receive an X-ray beam; and

readout electronics connected to the X-ray detector.

15. (Cancelled)

16. (Currently Amended) The X-ray examination of claim 14, further comprising a Faraday cage surrounding the ~~variable~~ voltage supply.

17. (Original) The X-ray examination system of claim 16, wherein the Faraday cage is connected to the filament bias connection.

18. (Cancelled)

19. (Original) The X-ray examination system of claim 14, wherein the free ions are positive ions generated in proximity to an X-ray tube cathode during operation of the X-ray examination system.

20. (Cancelled)

21. (Currently amended) The X-ray tube subsystem of claim 1, wherein said X-ray tube forms positive ions about said cathode, ~~and said second voltage level at said grid is negative with respect to said filament bias connection to cause said positive ions to be collected at said grid~~ and said grid voltage supply is a variable grid voltage supply.

22. (Currently amended) The method of claim 9 wherein said X-ray tube produces positive ions about said cathode, and said ion collection voltage is created through a variable voltage supply.

23. (Currently amended) The X-ray examination system of claim 14 wherein said X-ray tube forms positive ions about said cathode, ~~and said second voltage level at said grid is negative with respect to said filament bias connection to cause said positive ions to be collected at said grid~~ and said grid voltage supply is a variable grid voltage supply.

24. (Previously presented) The X-ray tube subsystem of claim 1 wherein said X-ray tube produces ions and said grid collects said ions at said grid to eliminate effects of said ions on an electric field around said cathode.

25. (Previously presented) The method of claim 9 wherein said X-ray tube produces ions and said grid collects said ions at said grid to eliminate effects of said ions on an electric field around said cathode.

26. (Previously presented) The X-ray examination system of claim 14 wherein said X-ray tube produces ions and said grid collects said ions at said grid to eliminate effects of said ions on an electric field around said cathode.